

The Factors that Influence Adoption and Usage Decision in SMEs: Evaluating Interpretive Case Study Research in Information Systems

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Abstract: The conventions for evaluating information systems case studies conducted according to the natural science model of social science are now widely accepted, as a valid research strategy within the Information System research community. While these criteria are useful in evaluating case study research conducted according to the natural science model of social science, however, they are inappropriate for interpretive research. The nature and purpose of interpretive research differs from positivist research. Although, there are no agreed criteria for evaluating research of this kind, nonetheless, there must be some criteria by which the quality of interpretive research can be evaluated. This paper evaluates a case study research conducted under the interpretive philosophy. The paper discusses the criteria proposed by Myers (1997) for evaluating interpretive research in information systems.

Keywords: Interpretive research, case study, IS evaluation, internet, SME

1. Introduction

This paper presents an evaluation of an interpretive in-depth case study. It uses Myers (1997) for the evaluation. The conventions for evaluating information systems case studies conducted according to the natural science model of social science are now widely accepted. Benbasat et al (1987), Lee (1989) and Yin (1994) formulated a set of methodological principles for case studies that were consistent with the conventions of positivism. As a result, case study research is now accepted as a valid research strategy within the Information System research community. The principles proposed in their work have become the de-facto standard against which most case study research in information systems is evaluated. However, while their criteria are useful in evaluating case study research conducted according to the natural science model of social science, the positivist criteria they suggest are inappropriate for interpretive research.

The use of interpretive approach is relatively new to information systems field, the approach has emerged as a valid and important strand in information systems research and most mainstream IS journals now welcome interpretive research and significant groups of authors are working within the interpretive tradition (Walsham, 1995). One of the main aims of interpretive research is seeking meaning in context. The use of interpretive perspective can help researchers to understand human thought and action in social and organisational contexts. It has the potential to produce deep insights into information systems phenomena including the use and the management of information systems. The interpretive research does not subscribe to the idea that a pre-determined set of criteria can be applied in a mechanistic way, it does not follow that there are no standards at all by which interpretive research can be judged.

Striving and ensuring rigor in interpretive study requires different criteria through which one views and judges the quality and completeness of the research process. Many researchers (Orlikowski et al, 1991; Walsham, 1993, 1995; Klein and Myers, 1999) have addressed qualitative research and they have shown how the nature and purpose of interpretive research differs from positivist research. At present, there are no agreed criteria for evaluating research of this kind. Nonetheless, there must be some criteria by which the quality of interpretive research can be evaluated. Myers (1997) and Klein and Myers (1999) have proposed a set of criteria for the conduct and evaluation of interpretive research in information systems.

This study is not concerned with adhering to the scientific tenets of precision and replication, instead the study is concerned in seeking a theory that is compatible with evidence that is both rigorous and relevant and generally useful to other areas. The remainder of the paper is structured as follows. It begins with an overview of case study method and a discourse on the use of case study in

Information Systems. This will be followed by a description of the procedures involved in collecting and analyzing data in grounded theory method. Then the criteria proposed by Myers (1997) for evaluating interpretive research will be discussed in relation to this particular study. Myers suggests that interpretive research can be evaluated in terms of theory and in terms of data. Finally, the paper presents further research and some conclusions

2. Methodology

2.1 Case study

The purpose of using case study was to provide an understanding of the factors that influence Small to Medium-sized Enterprises (SMEs) decision to adopt and use Internet in business. The aims of using case study are: (1) to elicit qualitative information (2) to produce an in-depth and holistic study (Yin, 1994), that gives the reader sufficient contextual and environmental descriptions to allow them to transfer the case studies based on conceptual applicability. The case studies are reported with sufficient detail and precision to allow judgements about transferability. (3) And to generate theory which is fully grounded in the data (Dey, 1993). The case study involved extensive interviewing of key participants (e.g. company owner or manager in each of the SMEs), coupled with the use of documentary evidence such as company reports.

Case study has a long tradition in IS research as a method of providing rich and contextual data, and it is the most widely used qualitative research method in information systems research (Benbasat et al, 1987; Orlikowski and Baroudi, 1991; Galliers, 1992; Myers, 1997; Yin, 1994; Gable, 1994; Walsham, 1993, 1995; Cavaye, 1996). Orlikowski and Baroudi (1991), Benbasat et al (1987) and Myers (1997) argue that case study method is particularly appropriate for the study of information systems development, implementation and use within organizations. It is particularly appropriate when theoretical knowledge on the phenomenon under investigation is limited and an understanding is not well developed (Benbasat et al, 1987), these include areas where a phenomenon is dynamic and not yet mature or settled, such as Internet adoption and usage where there are few existing theories to explain the phenomenon.

The benefits of multi-case study have been discussed by other information systems researchers (Yin, 1994; Benbasat et al, 1987). According to Yin, case study can involve single or multiple cases and numerous levels of analysis. Yin suggests that multiple case designs are desirable when the intent of the research is descriptive, theory building or theory testing. Benbasat et al. (1987) argue that multiple case studies enable the researcher to relate differences in context to constants in process and outcome and also multiple cases allow for cross case analysis and the extension of theory. Miles and Huberman (1984) add that multiple cases enable the researcher to verify that findings are not merely the result of idiosyncrasies of the research setting.

Earlier studies (Baker et al, 1997; Poon and Swatman, 1999) on SMEs and the Internet have made use of multi-case studies to gather data. The multi-case study was designed as a series of interviews and site visits. Most authors are vague when it comes to suggesting how many actual cases to study, but Eisenhardt (1989) suggests that multiple case designs require the study of at least four, but not more than ten cases. For pragmatic reasons of time, the number of cases in this study was planned in advance; the study involved seven SME cases that were purposefully selected.

2.2 Case participants

The criteria for inclusion were based on a need for each participating SME to conform to the definition of SMEs and a willingness on the part of the SME owners/managers to disclose details of their business. Several potential SMEs were rejected on the grounds that they did not satisfy the criteria. A total of seven SMEs that satisfied the criteria were chosen to participate in this study. These SMEs were chosen across business sectors so that the study could investigate the existence of sector-independent issues. This was important to avoid observations specific to a particular sector. The first SME was selected at random from the seven SMEs to provide the first body of data. Then subsequent data collection was guided by the theoretical sampling principle of grounded theory as defined by Strauss and Corbin (1990); i.e. sampling on the basis of concepts that have proven theoretical relevance to the evolving theory. The primary details of the SMEs that participated in the case study are shown in table 1 in no significant order.

Table 1: Details of SMEs that participated in the case study

SMEs	Type of business	Size (employees)	Turnover (£m)	Established
BIL	Peugeot cars franchise holder	20	7.5	1932
BPC	Publishing	25	N/A	1973
SAH	Health care	200	6	1969
MGL	Manufacturer of contract carpets	9	1.7	1972
AL	Manufacturer and seller of educational engineering equipment	40	5-7	1960
FP	Specialist flooring manufacturer	110	N/A	1984
CLR	Cigarette paper manufacturer	180	N/A	N/A

Source: (case study data, 2006)

3. Data analysis

Grounded theory is chosen for analysing the case study data, with the aim of generating a descriptive and explanatory theory of the adoption of the Internet rooted in the experiences of the SMEs. It is a general style of doing analysis that does not depend on any particular disciplinary perspectives (Strauss 1987). A grounded theory is one that is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to a particular phenomenon (Strauss and Corbin, 1990). Strauss (1987) emphasises the usefulness of the case study approach when used with grounded theory. It is an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical data (Martin and Turner, 1986; Glaser and Strauss, 1967). This generative approach seemed particularly useful here given that the objective of the case study was the discovery of theory that explains the factors that influence adoption of the Internet in SMEs.

Grounded theory is iterative, requiring a steady movement between concept and data, as well as comparative, requiring a constant comparison across types of evidence to control the conceptual level and scope of the emerging theory. It offers a way of attending in details to qualitative material in order to develop systematically theories about the phenomena being studied. Turner (1981) suggests that grounded theory is particularly well suited to dealing with qualitative data of the kind gathered from participant observation, from the observation of face-to-face interaction, from semi-structured or unstructured interviews, from case-study material or documentary sources. Typically, these particular kinds of inquiry generate large amounts of data, which accumulate in non-standard and unpredictable formats. The grounded theory approach offers the researcher a strategy for sifting and analysing material of this kind. A particular strength of utilising grounded theory is that a documented record of the progress of the analysis is generated. Hence, it is always possible to trace the derivation of any concept or model by checking back through the data and memos.

The focus here is on developing a context-based description and explanation of the phenomenon, rather than an objective, static description expressed strictly in terms of causality (Boland, 1979, 1985; Chua, 1986; Orlikowski and Baroudi, 1991). The research developed theory which described and explained the adoption and usage of the Internet in terms of an interaction of contextual conditions, actions, and consequences, rather than explaining variance using independent and dependent variables (Orlikowski, 1993).

3.1 Grounded theory analysis of case data

The data analysis process involved in identifying patterns in the case study data. These patterns included issues raised repeatedly across interviews, commonly found in Internet commerce activities or opinions, which kept re-appearing. The data were analysed within each case as well as across the cases to detect similarities and compare differences. The initial concepts that emerged in one case context were then contrasted, elaborated, and qualified in the other. Within the first case, the iterative approach of data collection, coding, and analysis was more open-ended, and generative, focusing on the development of concepts, properties, and relations, and following the descriptions of how to generate grounded theory set out by Glaser and Strauss (1967) and Eisenhardt (1989). The detailed

write-up of the cases and all the data generated by interviews, and documentation were examined and coded by focusing on the factors that influence adoption and use of the Internet in business.

The case data was read and categorised into concepts that were suggested by the data rather than imposed from outside. This is known as open coding (Strauss and Corbin, 1990, 1998) and it relies on an analytic technique of identifying possible categories and their properties and dimensions. Once all the data were examined, the concepts were organised by recurring theme. These themes became prime candidates for a set of stable and common categories, which linked a number of associated concepts. This is known as axial coding (Strauss and Corbin, 1990) and it relies on a synthetic technique of making connections between subcategories to construct a more comprehensive scheme.

The case data were then re-examined and re-coded using this proposed scheme, the goal being to determine sets of categories and concepts that covered as much of the data as possible. This iterative examination yielded a set of broad categories and associated concepts that described the salient conditions, events and experiences associated with adoption and use of the Internet in this first SME case. These initial concepts guided the remaining case study, allowing the process of data collection, coding, and analysis to be more targeted. Following the constant comparative analysis method (Glaser and Strauss, 1967), the initial SME case's experiences were systematically compared and contrasted with the second SME case. This analysis also used Miles and Huberman's (1984, 1994) technique for across-site pattern comparison and clustering that involves matrix displays to compare key events, triggers, and outcomes.

Data from the second SME case was first sorted into the initial concepts generated by the first SME data. It soon became clear however, that the initial concepts generated by the first SME case did not accommodate some of the findings emerging from the second SME case. Accommodating the second SME case's experiences, led to some important elaborations and clarifications in the emerging theoretical framework, and forced a reconsideration of some of the first SME case's experiences. For example, the category environmental factor did not include a concept of external pressure from trading partners, as this was not salient in the first SME case. The second SME case's experiences, however, indicated that they started using the Internet because they were pressurised into doing so by their trading partners, which was indeed very relevant in shaping the interpretations and use of the Internet, and substantially influenced their decision to adopt the Internet.

The process of comparing and contrasting the SME case data was repeated for the remaining SME cases. Redefining the initial concepts to incorporate considerations of the second SME case's experiences required returning to the first SME case data, and re-sorting and re-analysing them to take account of the richer concepts and more complex relations now constituting the framework. This ability to incorporate unique insights during the course of the study is one of the benefits of a grounded theory technique, an example of what Eisenhardt (1989) labels "controlled opportunism," where "researchers take advantage of the uniqueness of a specific case and the emergence of new themes to improve resultant theory".

The iteration between data and concepts ended when enough categories and associated concepts had been defined to explain what had been observed at all the SME cases, and no additional data was found, to develop or add to the set of concepts and categories, a situation Glaser and Strauss (1967) refer to as "theoretical saturation". The resultant framework is empirically valid as it can account for the unique data of each SME case, as well as generalise patterns across all the SME cases (Eisenhardt, 1989). The core categories and subcategories that emerged from the analysis are shown in table 2.

4. Evaluation of interpretive research in terms of theory

With regard to theory, Myers (1997) suggested that interpretive research could be evaluated in terms of its contribution to the field and whether the author has developed or applied new concepts or theories? The theoretical focus of this study was the factors influencing adoption and use of Internet in small to medium-sized enterprises (SMEs). The result of the case study analysis was used to develop a theoretical model that explains the factors that influence SMEs decision to adopt and use the Internet in business. The results of the case study were discussed in terms of the categories that emerged from the grounded theory analysis process (see Table 2 above for the categories that emerged from the case study analysis) and integrated insights from the existing body of literature. The theoretical model was then revisited and reconsidered in light of the literature review and the

empirical findings. Existing literature has also been integrated into the reporting and discussion of this research study.

Table 2: Core categories and subcategories that emerged from the data analysis

Core categories	Subcategories
<i>Technological factors</i>	Compatibility
	Complexity
	Cost effectiveness
	Benefits of using the Internet <i>The Internet generates new business opportunities</i> <i>Communication medium to improve organisational efficiency</i> <i>Better customer service</i> <i>Easy entry into new markets</i> <i>Promotional and adverting</i> <i>Global markets reach</i> <i>Easy access to global information</i>
	Perceived usefulness of the Internet
	Perceived richness of the Internet
	Perceived Ease of use of the Internet
<i>Organisational factors</i>	Management Support
	Organisational resources
	Organisational size
<i>Environmental factors</i>	Competitive pressure
	External pressure
<i>Barriers to Internet adoption</i>	Security
	Lack of knowledge
	Cost of Investment
	Limitation of infrastructure
	Uncertainty about the Internet
	Limitation of personal contact
	Lack of universal electronic payment systems

Source: fieldwork 2006

Another key issue considered by Myers (1997) is whether the author offers rich insights into the human, social and organisational aspects of information systems development and application. The analysis of the data from the field study provided rich insight into how SMEs currently use the Internet to carry out tasks, and it offers a far richer understanding of the factors that influence their decision to adopt the Internet. The rich varieties of SMEs' viewpoints were captured through the use of different data collection techniques, such as questionnaire and interview. Each of these techniques offered a different avenue for the SMEs to express their perception of Internet usage in business and the materials provided consistency in the same procedures being used for each case (Yin, 1994). The use of multiple techniques to elicit SMEs' viewpoints acted as a means of testing one source of information against other sources and this helped in improving the quality of data and provided a richer, contextual basis for interpreting and validating results (Kaplan and Duchon, 1988).

The final key issue Myers (1997) considered is whether or not the study contradicts conventional wisdom and thus provides richer understanding. The study developed a theoretical model that provided a far richer understanding of the factors that influence SMEs decision to adopt and use the Internet in business. The categories of technological, organisational and environmental factors were shown to be relevant in influencing adoption and use of the Internet while barriers to Internet adoption hinder adoption of the Internet. The theoretical model proposed in the study (see figure 1) is different from the existing frameworks of Rogers (1983) diffusion of innovation theory and the technology acceptance model of Davis (1989), because the proposed model added new constructs to these theories.

The technology acceptance model (Davis, 1989) with its two constructs of perceived usefulness and perceived ease of use and the diffusion theory (Rogers, 1983) with its innovation attributes are limited in explaining the adoption and use of the Internet in SMEs. These models considered only the technological aspect of adoption of innovation; they are based on the deterministic assumptions of

technological imperative, and hence discount the importance of human intentions and action in shaping the adoption and use of technology. They are variance models, and hence do not adequately capture the contextual issues that are fundamental in explaining adoption of Internet in SMEs.

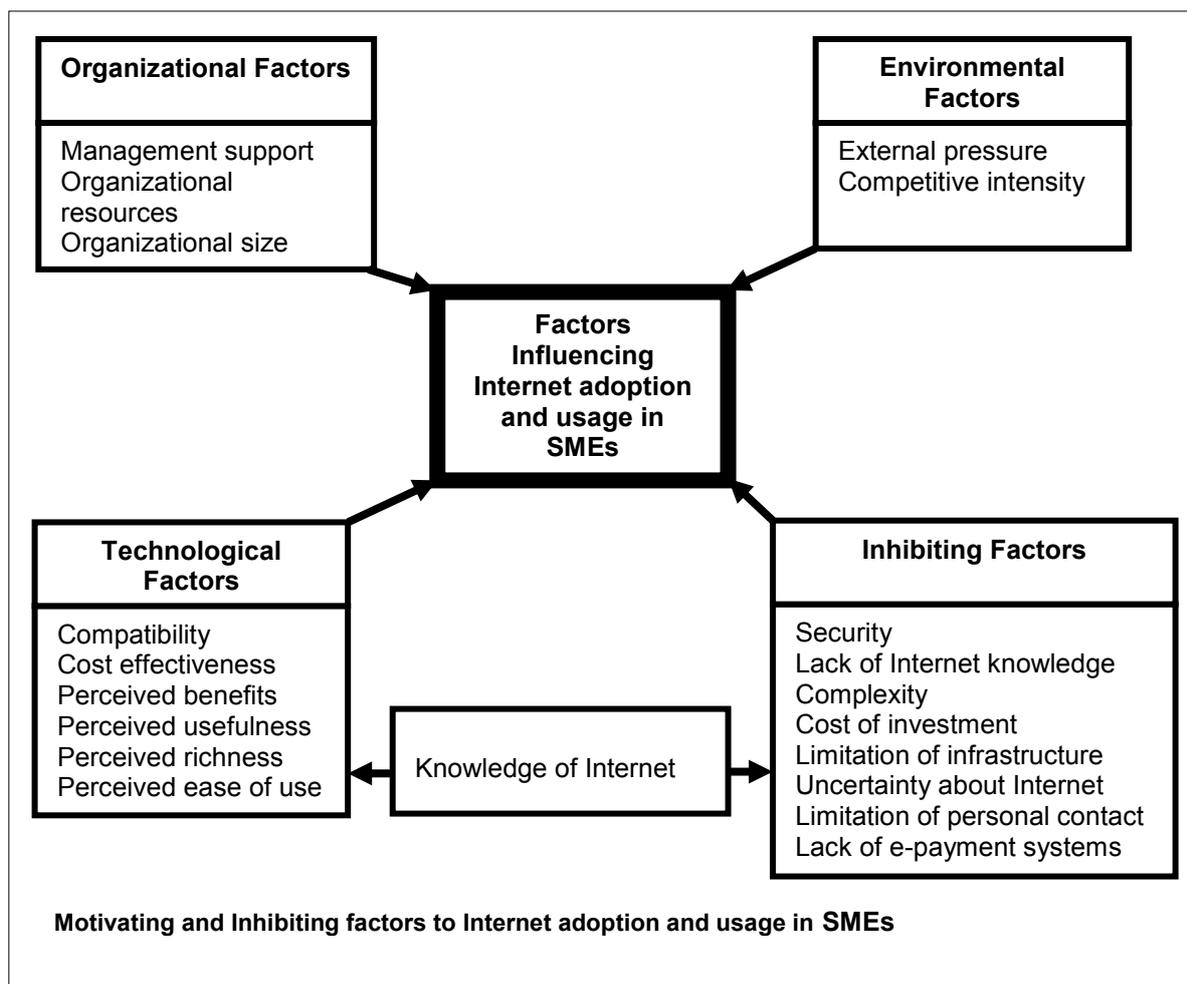


Figure 1: SME internet adoption and usage model (source: fieldwork 2006)

The theoretical model developed in this study redressed the limitations of these models by accounting for organisational and environmental factors relevant to adoption and usage of IS in organisation. The case result has shown that other factors such as organisational characteristics (e.g. resources) and environmental characteristics (external pressure) are necessary in explaining the adoption and use of the Internet in SMEs. The study extended the diffusion of innovation theory and the technology acceptance model by adding these new constructs of organisational and environmental factors to better explain the adoption and use of the Internet in SMEs.

5. Evaluation of interpretive research in terms of data

With regard to data, Myers (1997) suggests a significant mass of data must have been collected for significant insights to emerge. The combination of different data techniques provided a significant quantity of data that enabled significant insights to emerge. It provided a sufficient range of examples of how and why SMEs adopted and used the Internet in business. The study provided sufficient citations and quotes in each of the cases used and this provided an important way of ensuring internal validity in the study. The diversity of SMEs backgrounds in this study provided a considerably broader context and process of Internet usage in business. It also provided rich insights into the human, social and organisational aspects of information systems adoption and use.

Myers (1997) suggests that a good piece of interpretive research should represent multiple viewpoints and alternative perspectives. Multiple viewpoints and alternative perspectives occurred in this study through the inclusion of adopters of the Internet and non-adopters. When the participants were selected, it was decided that both SMEs that used the Internet and those that did not use the Internet in business be selected for this study. The inclusion of SMEs with different level of Internet use and

those that did not use the Internet in business enabled the researcher to gather different viewpoints from the participating SMEs and it provided different viewpoints on the factors that influence adoption. Therefore, given the diversity of backgrounds of the SMEs selected for this study, both the context and the process of Internet usage differs considerably, thus providing a broad social context.

Another issue Myers (1997) considered is whether sufficient information about the research method and the research process has been presented. The application of the specific research method chosen for this study, which was based on interpretive paradigm and used qualitative case study, was discussed in the methodology section above. The interpretive approach shows that the whole arena of social relations revolves around shared meanings, interpretations, and the production and reproduction of cultural and social reality by humans. It motivates investigations into how humans enact a shared social reality through understanding human behaviour from their point of view of the world. Considerable attention was devoted to the research process, in terms of both the philosophical underpinnings of the research method as well as the practicalities of conducting the study. Details of this have been provided in Lawrence (2002), which outlined how the data was gathered, when and where the research took place, how the research was developed over time, and how the data was analysed.

Myers (1997) concludes that the most important question relating to the quality of the contribution concerns the significance of the findings for both researchers and practitioners. This study has several important strengths in addition to having been designed explicitly to develop a theory of adoption and usage of Internet in SMEs. The study adopted a strategy of methodological triangulation that yielded both qualitative and quantitative evidence intended to facilitate the interpretation of results.

6. Contribution of interpretive research

The contribution of this study can be judged from a number of perspectives. The research has presented a broader picture of how SMEs currently use the Internet to carry out tasks, and the factors that influence their decision to adopt it in business.

A number of recent developments indicate that the factors influencing the decision to adopt IT is one of the most important issues facing many organisations, particularly SMEs. The UK Labour government published a white paper on the uptake of the Internet in SMEs in response to growing global competition of information technology, particularly the Internet. The importance of Internet in organisation continues to be important today than ever before. The white paper (entitled 'Information Highway') relates specifically to the role and importance of SMEs to the economy. It reinforces the importance of SMEs participation in global trade and for researchers in examining the role of the Internet in SMEs business. This present research is therefore both relevant and timely. The findings make a significant contribution to the understanding of the factors that influence SMEs decision to adopt and use the Internet in business.

The limited research conducted in the UK into adoption of the Internet in SMEs has tended to focus on Internet usage. The factors influencing the decision to adopt the Internet in SMEs have not attracted the attention of the research community. This trend is consistent with the research focus in other countries. Within the context of the UK this study breaks new ground because it focuses exclusively on SMEs decision to adopt and use the Internet.

The factors influencing large organisations decision to adopt and use the Internet are significantly different to the factors influencing SMEs. Findings from the relatively substantial amount of research conducted into adoption of IT in large organisations may not be relevant for an understanding of SMEs decision to adopt similar technologies which have a range of different functional characteristics. The findings from this study go some way towards addressing this imbalance in the research focus. The study is also useful for researchers interested in understanding factors that influence the adoption of information systems in organisations; or it may be used in studies within and across organisations by researchers who are interested in understanding the diffusion of information technology and the determinants of technology adoption.

The findings from this study can also act as a guide to help decision-makers take advantage of the Internet for business and it can help practitioners and researchers understand its growth in the marketplace. The study provides researchers and business planners with information on the growth

and development of the Internet in the UK, and allows them to compare and contrast developments in the UK with the growth of Internet in North America and other European countries.

Another significance aspect of this study is the development of an Internet adoption model based on theory-driven case study that explains the factors that influence or inhibit SMEs decision to adopt and use Internet in business. The model shows technological, organisational and environmental factors as important constructs that explains IT adoption and usage in organisation.

Drawing on the rich data of SMEs' experiences, the study generated a grounded understanding of the factors that influence adoption and use of the Internet in SMEs. This grounded theory is valid empirically because the theory-building process is so intimately tied with evidence that the resultant theory is consistent with empirical data. While many believe that building theory from a limited number of cases is susceptible to researchers' preconceptions, the author argues persuasively that the opposite is true. The iterative comparison across cases, methods, evidence, and literature that characterises such research leads to a constant comparison of conflicting realities that tends to "unfreeze" thinking. The process has the potential to generate theory with less researcher bias than theory built from incremental studies or armchair, axiomatic deduction (Orlikowski, 1993).

The grounded theory developed in this study added substantive content to the understanding of the factors that influence SMEs decision to adopt and use the Internet, such an understanding has been absent from the research and practice discourses on the use of the Internet in SMEs. The approach followed here focused specifically on developing such an understanding, thus bringing a fresh set of issues to the already-researched topic of the Internet. The study integrates grounded theory with the more formal insights available from the innovation literature, developing a more revised general theoretical model that allows researchers and practitioners to explain the adoption and use of the Internet in organisations.

7. Implications of research findings

The study has shown the areas SMEs used the Internet most and how they currently used it to carry out tasks in their business. It has presented the results of a grounded theory analysis into the adoption and use of the Internet and a deeper understanding of the main factors responsible for SME decision to adopt and use the Internet in business. It has developed an enriched theoretical model for conceptualising the adoption and use of the Internet in SMEs. The study results indicated that technological, organisational and environmental factors influenced adoption and use of the Internet, while barriers to Internet adoption hindered adoption. The findings and framework articulated here have important implications for both researchers and practitioners.

7.1 Implications for research

From an academic researcher's perspective, the findings suggest that innovation adoption theories should not only account for technological factors (innovation characteristics), but also organisational and environmental factors should be included in IT adoption and use in organisation. Although the adoption of the Internet in SMEs has been led by Internet attributes, however, the case result has shown the importance of organisational and environmental factors in SMEs decision to adopt and use the Internet in business.

The existing theories such as technology acceptance model (Davis, 1989) and diffusion of innovation theory (Rogers, 1983) were developed with the concept of static individual computing environment in mind. As such, in today's rapidly changing IT environment, they do not provide adequate explanations of an organisation's IT usage behaviour (Kang, 1998). Further, there has been little or no previous study done to examine the applicability of these models to the SME context.

The technology acceptance model (Davis, 1989) posits that both perceived ease of use and perceived usefulness correlate with system use. The model's two constructs are limited to technological attributes of usefulness of computer technology and the ease of use of the technology. The model, with its assumption of users being motivated primarily by job performance expectations from IS use, may be considered as a model of compliance. In this model, the users are motivated to use the IS to gain specific rewards. However, the model is influential in the contribution to the enduring line of IT adoption and diffusion research. It has proved useful for understanding the factors involved in organizational adoption decision making.

The same criticism goes to diffusion theory (Rogers, 1983) that considers innovation characteristics for adoption of innovation. However, diffusion theory provided a useful perspective on the adoption of innovations and diffusion in organisation. Fichman (1992) argues that conclusive results were most likely when the adoption context closely matched the contexts in which diffusion theory was developed for example, individual adoption of personal-use of technologies or when researchers extended diffusion theory to account for new factors specific to the IT adoption context under study. There are other factors to consider when organisations are adopting any technological innovation, such as the organisational characteristics (e.g. resources) and environmental factors (external pressure); these factors emerged as important in the adoption of the Internet in SMEs.

An alternative model that extended the technology acceptance model and diffusion of innovation has been proposed see Lawrence (2002) based on the findings from a theory-driven case study. The proposed theoretical model redressed the inadequacies of these models by developing a more enriched adoption model that considered not only the technological characteristics, but also the organisational as well as the environmental factors. The diffusion of innovation of Rogers (1983) and technology acceptance model of Davis (1989) have been expanded by incorporating, both technological organisational and environmental factors. Within the proposed model, each of these factors was shown as having an influence on the decision to adopt and use the Internet in SMEs. The models were extended to an SME context, whereas most previous research has used these models in large firms or on college students (Igbaria et al, 1997; Davis, 1989).

Empirical validation and elaboration of these concepts in other settings are clearly needed. The theoretical model was generated by only examining few cases, albeit in depth. More empirical grounding and comparisons will sharpen and enrich the concepts developed here and yield more complex understanding of the phenomenon. It is also necessary to investigate different contexts where the Internet has been introduced. While the SMEs studied here differed significantly on environment, strategy, size and structure, they still only represent few organisational types.

More organisations need to be examined to ascertain whether the proposed concepts and model are relevant in other situations. In this way, the analytic generalisation posited here, that other organisations' experiences with the Internet would resemble the patterns detailed above will be tested and elaborated. While more empirical work is necessary to elaborate and verify the theoretical model, it is believed that a useful starting point has been made. Understanding the factors that influence adoption of the Internet allows researchers to explain why SMEs introduce Internet technology in their business.

7.2 Implications for practice

There are many characteristics of the Internet that are useful to SMEs in particular and organizations in general. The Internet is non-proprietary and offers gains in both effectiveness and efficiency and it has the potential to change the nature and diversity of interpersonal interactions and how business is conducted (Fulk et al, 1986) as well as the organisation itself (Rogers, 1986).

A growing issue in organizations is the overuse of paper for hard copies. Paper copies must be stored physically, which incurs great cost, and environmental concerns are beginning to weigh heavily on organizations, leading to pressure to reduce paper consumption when possible. Although FAX transmissions are fast, they still consume paper, and costs rise quickly if the transmission is a long one over great distances. On the other hand, the Internet is fast and through its asynchrony, eliminates the need for communication to take place at the same time. The asynchrony of the Internet helps to reduce "telephone tag". It also lessens the impact of geographical distance between customers, suppliers and business partners and through its email function provides directness between sender and receiver. Due to automatic time and date stamping, email messages, if saved, can serve as useful audit trails and organizational histories.

The study has also identified key factors that influence adoption and use of the Internet in SMEs. The results point out that compatibility of the Internet and their relative advantages (in terms of operational and strategic benefits potential) are important facilitators of adopting the Internet in business. This suggests that SMEs contemplating using the Internet should explore and set up appropriate mechanisms to become more clearly aware of the technology. Industry-based associations and trade publications may be a few mechanisms to generate in-depth awareness of the Internet. Interaction with peer firms in the industry and their experiences may motivate SMEs to adopt and use the

Internet. Such efforts would also help them to engage in initial experimentation that can significantly aid their own learning process and better understand the degree to which the Internet would be compatible with existing environments and work practices. The results also point out that management support and commitment is a crucial element in adopting and using the Internet in SMEs.

The study findings indicated that efforts should focus initially on greater management support. Education and training programs should aim to increase awareness of the Internet and emphasise the benefits of using it in the organisation. The theoretical model developed and presented here suggests that before the implementation of a technology such as the Internet, managers in the organisation should articulate their intentions with respect to the technology and assess its usefulness and the resultant organisational consequences of the technology. A better understanding of these factors may enable practitioners to formulate strategies for improving the adoption and usage of the Internet in organisations.

The theoretical model developed here meets the criteria of practical applicability proposed by Glaser and Strauss (1967). It fits the substantive area of study. The concepts and relations posited as central are intimately related to the arena of the Internet adoption and usage. The theoretical model is sufficiently general to be applicable to a range of situations around the adoption and use of the Internet in particular and IT in general. It is readily understandable by practitioners, and should consequently provide some useful guidance in the organisations introducing the Internet. By providing practitioners with some insight into the context and the factors that influence the decision to adopt and use the Internet, the theoretical model serves as a basis from which the IS practitioner can assess and manage what is typically a poorly understood, complex, and dynamic situation (Orlikowski, 1993).

The theoretical model generated from the empirical findings has shown that the technological, organizational and environmental factors as well as the context, in which the Internet is used, played an important role in shaping the adoption of the Internet in SMEs. It has provided valuable insights for practitioners, detailing the factors that influence the decision to adopt and use the Internet in a business environment. The study has suggested that practitioners will be better able to adopt the Internet in business, if they understand how these factors influence its adoption and usage.

While all research methodologies have strengths and weaknesses, the use of the grounded theory approach for the case study analysis here was particularly appropriate, generating a set of insights, concepts, and interactions that address the main factors involved in adopting and using the Internet in business, elements to date largely overlooked in the adoption literature (Orlikowski, 1993). The study has made it clear that the success of adoption of an innovation in organization is dependent on a large number of factors. Managers should be aware of their potential impact on the adoption and diffusion of an innovation and of their interdependency. Applying the model of Internet adoption in organizations, as presented here, can enhance such an understanding.

8. Further research

This study is cross-sectional in nature, and the focus of the present study is on the adoption and usage of Internet in SMEs, which limits the ability to examine the processes involved in Internet adoption. The research has drawn conclusions about the adoption and use of the Internet in SMEs and has laid a foundation on which further longitudinal studies could be undertaken. It has identified technological, organisational and environmental factors and barriers that facilitate or hinder adoption of Internet technology. A longitudinal study tracing the factors during the various processes of adoption can address this limitation. Alternatively, instead of focusing on organisations, it may also be useful to examine the adoption of the Internet by individuals. Comparison can then be made between individuals and organisations in terms of factors influencing the adoption of the Internet, for example, characteristics such as purpose of use and usage behaviours or patterns. Additional research could be conducted to determine if other kinds of technological innovations are affected by these factors.

The study has developed a theoretical model of Internet adoption and use in SMEs. Two of the main strengths of this model are its parsimony and the derivation of its factors from the empirical case study. Although the case-based investigation of the theoretical model has provided insights into the factors influencing adoption and use of the Internet in SMEs, further empirical study is needed to assess the validity of the theoretical model proposed in this study in order to develop an appreciation of the relative contributions of the model's constructs.

Because this is one of the earliest attempts to build a theoretical approach to modelling SME adoption and use of the Internet, the researcher believes that the theoretical model and propositions can form the basis of larger scale studies to examine the validity and applicability of the model and improve and refine it. As with any other simple model, there is a danger that additional significant factors have not been included in the model. Researchers who believe that additional variables play a critical role in the adoption of the Internet could use the constructs developed in this study in their own studies to better estimate the influence of each factor.

A cross-sectional study such as this is useful in identifying the patterns of relationships among the relevant factors, but large-scale longitudinal research design is essential particularly, it would allow researchers to measure the explanatory factors that emerged from the case study before the adoption of the Internet and more objectively assess the impact of the Internet on the organisations. Finally, the researcher suggests that the model be applied in the context of larger organisations as well. Such empirical testing will allow the identification of the necessary modifications to the model to enlarge its generalisability and isolate the differences in the factors that influence the adoption decisions of both SMEs and large organisations.

9. Conclusions

The central concern of this study has been in gaining deep insight into current Internet usage in SMEs and the factors that influence their decision to adopt it in business. This study, which was based on empirical data, examined Internet usage as it is actually used in SMEs. The study has developed a model that considered the technological, organisational and environmental factors that explained the adoption and use of the Internet in SMEs. The author has argued both theoretically, and where possible, using empirical evidence, as to why these categories helped to better understand and explain Internet adoption and usage in SMEs. The study's results provided significant support to past findings in innovation and information systems literature.

The study was presented in a descriptive form and chronicles the perceptions and experiences of SMEs adoption and use of the Internet in business. Zeller (1991) suggests that studies with an interpretive perspective don't report out "data", they report "scenes" that is accounts of researchers' engagement over time with participants in their surroundings (Zeller, 1991 cited in Miles and Huberman, 1994). In addition, Hammersley (1992) argues that "an account is valid or true if it represents accurately those features of the phenomenon that it is intended to describe, explain or theorise". The study has presented the current picture of how SMEs used the Internet in practice and the factors that influenced their decision to adopt the Internet in business. It has told story of Internet adoption and use from the perspective of the SME cases examined.

The conclusions of the study were based on the analysis of the SMEs studied and not on a population. It is not the goal of an interpretive study to make generalisations from the examined SMEs, but rather to offer understanding or insights about the adoption and use of Internet in SMEs. A rich, thick description of the case allows readers to make decisions regarding transferability of the research (Merriam, 1988). This study has presented significant progress in Internet usage and toward explaining the factors influencing the adoption of the Internet in SMEs. The findings provided theoretical and practical insights into the adoption and use of the Internet in SMEs. The study has contributed to the existing body of research on IT usage in general and Internet usage in particular. Finally, the research reported here contributes to what is hoped will be a continually expanding body of empirical evidence that can increase knowledge of Internet technology usage in business.

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